FILE COPY

HANDBOOK

Model 20 Attenuator

KAY ELECTRIC COMPANY

14 Maple Ave., Pine Brook, N. J.

Copyright 1954 by Kay Electric Co.

HANDBOOK

MODEL NO. 20

ATTENUATOR

KAY ELECTRIC CO.
14 MAPLE AV., PINE BROOK
NEW JERSEY

HANDBOOK

Model No. 20

ATTENUATOR

KAY ELECTRIC CO.
14 MAPLE AV., PINE BROOK
NEW JERSEY

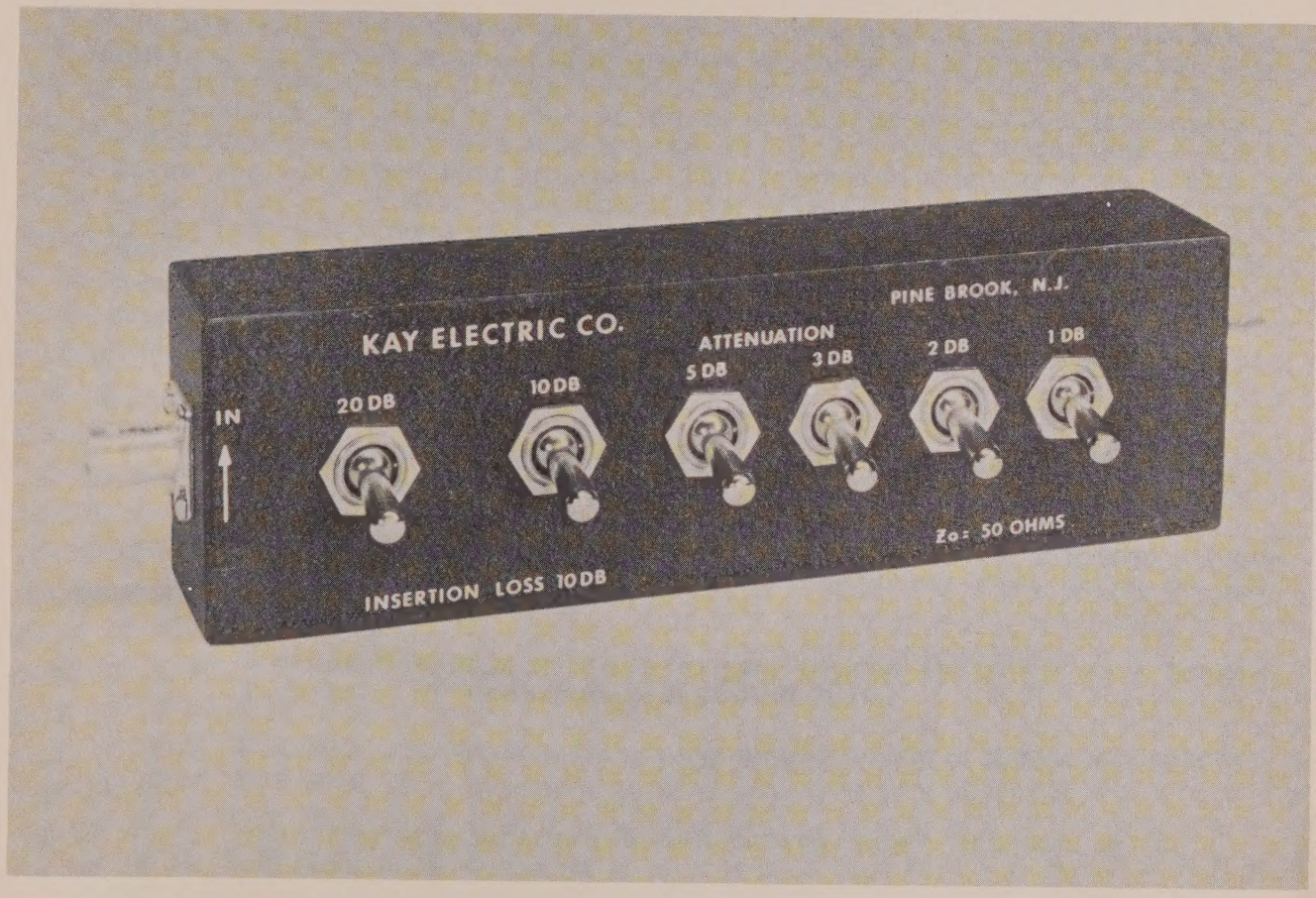


Figure 1 MODEL 20 ATTENUATOR

MODEL 20

ATTENUATOR

A. Purpose and General Description.-

The Model 20 Attenuator is designed to provide a means of inserting an accurate and fixed amount of loss in any electronic equipment operating in the DC-500 mc range. The lower limit of attenuation is fixed by the 10 db insertion loss of the attenuator. Six individual switches (20 db, 10 db, 5 db, 3 db, 2 db, and 1 db) allow the operator to supplement the insertion loss by 1 db steps to a total of 51 db. Both input and output impedances are constant at nominal 53.5 ohms throughout the useful range of the equipment. BNC type UG-185/U female connectors are used for input and output terminals. All components are housed in a rugged cast metal case which provides individual shielding for the 20-db and 10-db sections and overall shielding for the complete unit.

B. Typical Applications.-

1. Supplemental attenuator for instruments whose attenuation range is insufficient.

2. Replacement attenuator for instruments whose internal attenuators do not provide comparable accuracy (0.1 db/db to 500 mc).

3. Vernier attenuator where signal source includes only large-increment or uncalibrated attenuation.

4. General attenuator for instruments without internal attenuation.

5. Standard attenuator for evaluating other unknown or uncalibrated attenuator.

C. Technical Specifications.-

Frequency Range: DC to 500 mc.

Input & Output Impedance: 53.5 ohms, nominal.

Attenuation: Total, 51 db max.
Fixed Insertion Loss, 10 db.
Switchable, 41 db in 1 db steps.

Switch Steps: 20 db, 10 db, 5 db, 3 db, 2 db, 1 db.

Accuracy of Attenuation: Within 0.1 db per db of attenuation to 500 mc. Better accuracy at lower frequencies.

Connectors, Input & Output: BNC Type UG-185/U, female.

Dimensions: 2" x 8 1/4" x 1 1/2".

Weight: 2 1/2 lbs.

D. Operation.-

1. To avoid producing spurious losses through impedance mismatch, all input and output connections should be made with UG-88/U plugs and RG-55/U, RG-58/U, RG-58/A/U or RG-8/U cable.

2. A given attenuator section is placed in the circuit when its switch is in the upper position. All the switched attenuators are connected in series and are additive. Thus, to obtain 39 db attenuation (10 db fixed plus 29 db switched), throw the 20 db, 5 db, 3 db and 1 db switches to the upper position. Other degrees of attenuation, from 10 db minimum to 51 db maximum may be selected in a similar manner.

3. Note that the Model 20 Attenuator constitutes a direct d-c path and does not include internal protective devices in the form of fuses, decoupling capacitors, etc. To avoid damage to the internal components, do not apply excessive signals to the attenuator.

E. Maintenance and Repair.-

In normal operation, the rugged, simple, construction of the Model 20 Attenuator obviates the necessity for maintenance operations. If, however, it is necessary to replace one or more resistors, it should be noted that the values of some components have been factory-modified to obtain the precise and accurate degrees of attenuation specified in paragraph C. Since the value of any resistor replaced in the field may vary within its specified tolerance, it may be impossible to duplicate the specified operation of the Model 20 Attenuator unless the replacement resistors are similarly modified.

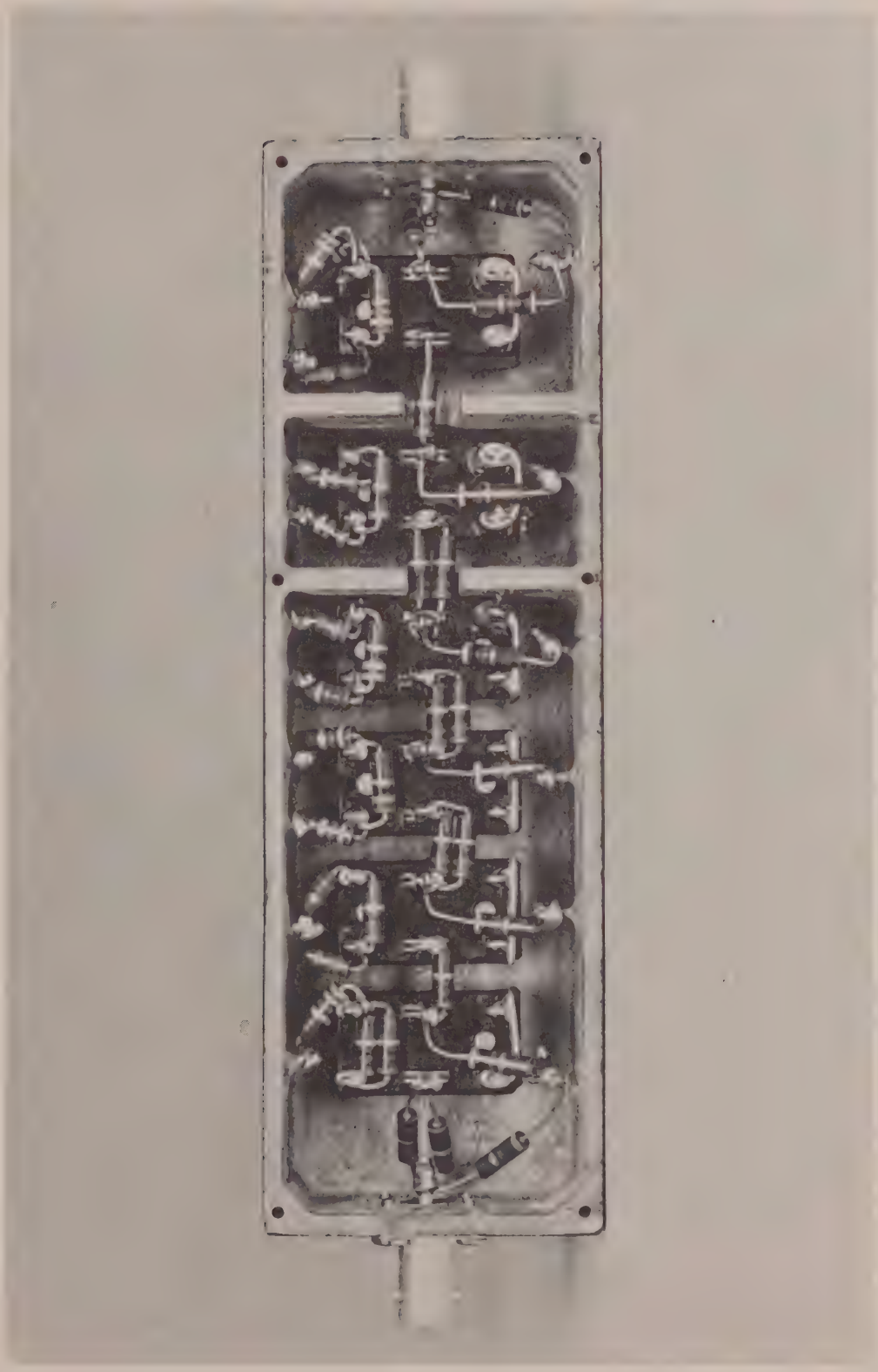
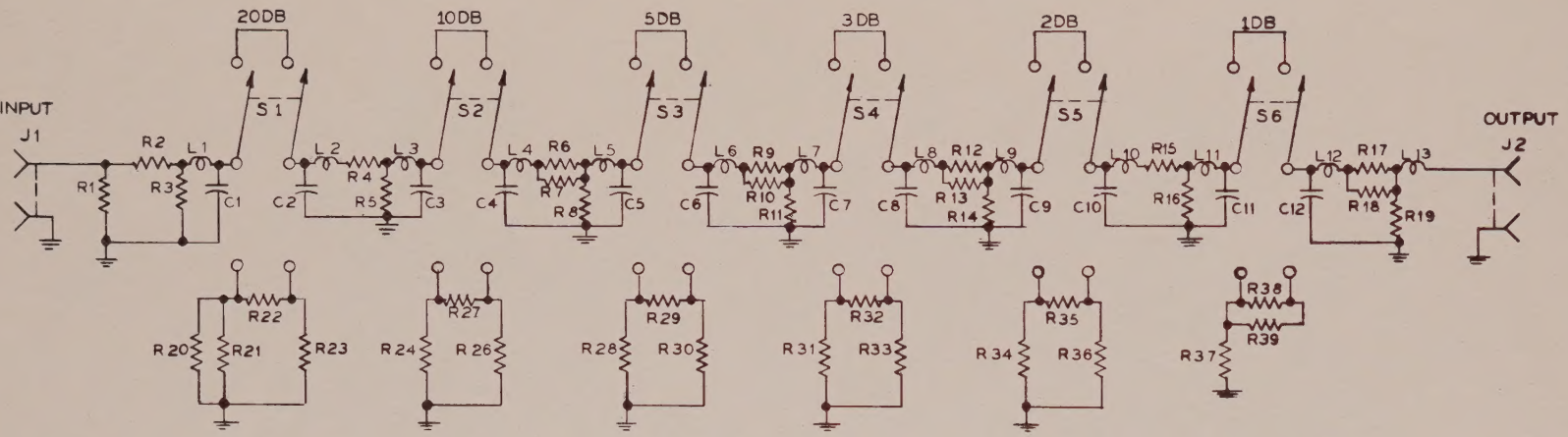


Figure 2 INTERNAL COMPONENTS



NOTE

ALL RESISTORS TRIMMED FOR EXACT ATTENUATION
CHECK AT 100, 200 & 400 MC
TRIM LEADS ON HIGH ATTENUATION UNITS
L & C'S ARE CAVITY INDUCTANCES AND CAPACITANCES

SCHEMATIC DIAGRAM MODEL NO.20 ATTENUATOR

KAY ELECTRIC CO. PINE BROOK, N. J.

SCHEMATIC	MODEL NO. 20 ATTENUATOR		
MAT.	FINISH:		SCALE:
DIMENSIONS TOLERANCES UNLESS OTHERWISE SPECIFIED: DECIMAL DIMENSIONS ± .002 FRACTIONAL DIMENSIONS ± .008			KAY ELECTRIC CO. PINE BROOK, N. J.
CHANGE	DATE	APP.	
B Inductances & Capacitances Added	4/4/55		
			DWN. BY AWPIERCE DATE 3-31-55
			APP. BY EEC DATE
			DWG. NO. KB 2881 B